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For: ISOLATION SYSTEM WITH ANALOG COMMUNICATION ACROSS  
AN ISOLATION BARRIER

1           1.       An isolation system with analog communication across an isolation barrier  
2   comprising:  
3                    an isolation barrier circuit having at least one isolation element;  
4                    a digital to analog circuit having an analog output connected to the  
5   isolation barrier and an input for receiving an input digital signal to be communicated  
6   across the isolation barrier; and  
7                    an analog to digital circuit having an input coupled to the analog  
8   output of the isolation barrier circuit for providing a digital output signal.

1           2.       The isolation system of claim 1 in which said digital to analog circuit  
2   includes an encoder circuit responsive to said input digital signal to provide a digital signal,  
3   and a digital to analog converter responsive to said digital signal to provide to said isolation  
4   barrier said analog output signal.

1           3.       The isolation system of claim 1 in which said digital to analog circuit  
2   includes a digital to analog converter with an input for receiving said input digital signal  
3   and a modulation circuit responsive to said digital to analog converter for providing said  
4   analog output.

1           4.       The isolation system of claim 1 in which said analog to digital circuit  
2   includes an analog to digital converter responsive to said input analog signal from said

3 isolation barrier to provide a digital signal, and a decoder circuit responsive to said digital  
4 signal to provide said digital output response.

1 5. The isolation system of claim 1 in which said analog to digital circuit  
2 includes a demodulator circuit responsive to said input analog signal from said isolation  
3 barrier, and an analog to digital converter responsive to said analog signal to provide said  
4 digital output signal.

1 6. The isolation system of claim 1 in which said analog to digital circuit  
2 includes an analog to digital converter.

1 7. The isolation system of claim 1 in which said digital to analog circuit  
2 includes a digital to analog converter.

1 8. The isolation system of claim 1 in which said digital to analog circuit  
2 includes a termination resistance connected with said isolation barrier.

1 9. The isolation system of claim 1 in which said analog to digital circuit  
2 includes a termination resistance connected with said isolation barrier.

1 10. The isolation system of claim 1 in which said isolation element includes a  
2 capacitance.

1           11.       The isolation system of claim 1 in which said isolation element includes a  
2       transformer.

1           12.       The isolation system of claim 1 in which said analog to digital circuit  
2       includes a common mode interference signal sensing circuit and a summing circuit for  
3       removing the common mode interference signal from the received analog signal from the  
4       isolation barrier.

1           13.       The isolation system of claim 1 in which said digital signal to be  
2       communicated across said isolation barrier includes data.

1           14.       The isolation system of claim 1 in which said digital signal to be  
2       communicated across said isolation barrier includes control information.

1           15.       The isolation system of claim 14 in which said digital signal to be  
2       communicated across said isolation barrier includes reference and calibration information.

1           16.       The isolation system of claim 1 in which said digital signal to be  
2       communicated across said isolation barrier includes data and control information.

1           17.       The isolation system of claim 2 in which the signal is a constant average  
2       signal.

1 18. The isolation system of claim 3 in which the signal is a constant average  
2 signal.

1 19. The isolation system of claim 4 in which the signal is a constant average  
2 signal.

1 20. The isolation system of claim 5 in which the signal is a constant average  
2 signal.

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1           21.     A bi-directional isolation system with analog communication across an  
2 isolation barrier comprising:  
3                     an isolation barrier circuit having at least one isolation element;  
4                     a first digital to analog circuit having an analog output coupled to a  
5 first side of the isolation barrier and an input for receiving an input digital signal to be  
6 communicated across the isolation barrier;  
7                     a first analog to digital circuit having an input coupled to the first  
8 side of the isolation barrier circuit;  
9                     a second digital to analog circuit having an analog output coupled to  
10 a second side of the isolation barrier and an input for receiving an input digital signal to be  
11 communicated across the isolation barrier; and  
12                     a second analog to digital circuit having an input coupled to the  
13 second side of the isolation barrier circuit.

1           22.     The bi-directional isolation system of claim 21 in which the input digital  
2 signals are communicated simultaneously across the isolation barrier circuit.

1           23.     The bi-directional isolation system of claim 21 in which the input digital  
2 signals are communicated alternately across the isolation barrier circuit.

1           24.     The bi-directional isolation system of claim 21 further including at least one  
2 echo cancellation circuit for removing a local echo signal from the input of at least one of

3 said first and second analog to digital circuits.

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